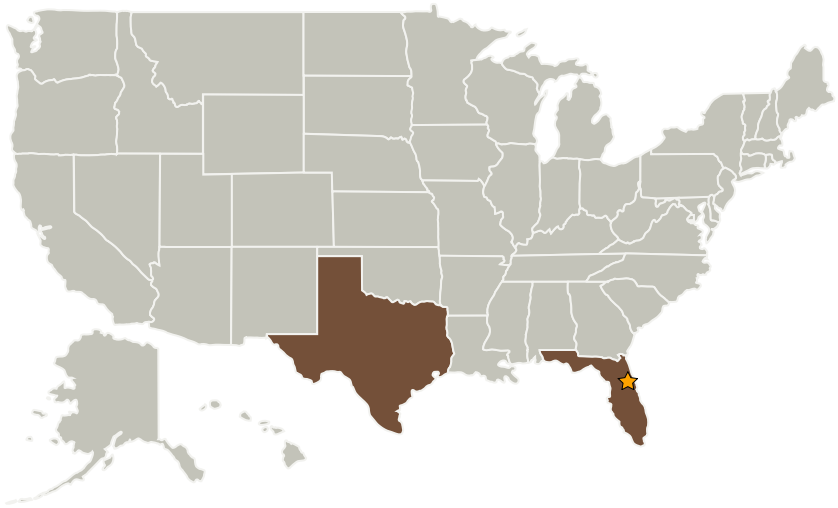
Rapid Detection of Gas Hazards and Leaks with an Atmospheric Sampling, High Resolution, Mass Spectrometer with Low Pumping Requirements, Phase I

Completed Technology Project (2006 - 2006)

Project Introduction

Miniaturization of mass spectrometers is restricted almost exclusively by the ability of small vacuum pumps to remove gas loads during operation of the instrument. Our answer to this dilemma is a specialized interface that focuses a parallel beam of ionized gas molecules through an orifice that is at least 10 times smaller than ever before achieved in a mass spectrometer inlet. Our recent patent application describes this interface. Not only can we use this interface to radically reduce the pumping requirements within the mass spectrometer, but it should also enable an unprecedented cooling and focusing of the ion beam. This in turn will enable attaining mass resolutions of over ten thousand in a phase I instrument which uses a linear time of flight tube of only 10 cm. A small overall instrumental footprint (probably 1.5 cubic feet including pumping and electronics) should be attainable in a phase II effort.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Kennedy Space Center(KSC)	Lead Organization	NASA Center	Kennedy Space Center, Florida
Ionwerks	Supporting Organization	Industry	Houston, Texas

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Table of Contents

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Primary U.S. Work Locations	
Florida	Texas

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Kennedy Space Center (KSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.5 Lasers